

REMARKS

In paragraphs 1 and 2 of the Office Action claims 1, 3, 6, 9, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macken et al (US. 2004/0075944 A1) in view of Huang et al (US. 6,699,427 B2), stating:

"Macken et al discloses a magnetic head 50 having a read head portion (12, 68, 66, 57, 60, 64 and 52) including an insulation base coat layer 52; a write head portion (12, 16, 58, 72, 54, 73, 18', 22) including insulation layers (73 and 18'); and wherein the insulation layer 18' of the write head portion having a negative thermal expansion characteristics (abstract, lines 3-6) as set forth in claims 1, 6, 9 and 15.

Macken et al also discloses that the negative thermal expansion material is selected from either Zirconium tungstate or hafnium tungstate (see [0034]).

Regarding claims 3 and 11, Macken et al discloses that the insulation layer that includes the negative thermal expansion material is a coil insulation layer 18' within the write-head portion.

Macken et al only discloses that the insulation is made of either Zirconium tungstate or hafnium tungstate (see [0034]). Macken et al does not explicitly disclose that the insulation is made from the group consisting of carbon fiber, carbon fiber in an epoxy matrix, carbon fiber in a photoresist matrix, zirconium tungsten in an epoxy matrix, zirconium tungsten in a photoresist matrix, hafnium tungsten in an epoxy matrix, and hafnium tungsten in a photoresist matrix as recited in claims 1, 6, 9 and 15.

Huang et al discloses that the insulation can be made of carbon fibers (column 1, lines 19-39); particularly, column 1, lines 36-39.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to manufacture the insulation of Macken et al with the carbon fiber as set forth, as taught by Huang et al.

The rationale is as follows: One of ordinary skill in the art would have motivated to make the insulation of Macken et al with the carbon fiber as set forth, as taught by Huang et al to provide an excellent resistance to heat flow, even at high temperatures in order to improve read/write characteristics of the magnetic head. Additionally, it has been held to be within the general skill of a worker in the art to select a known material having different chemical bonding structures on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416 (CCPA 1960)."

Applicant respectfully traverses this ground of rejection and asserts that Applicant's invention, as recited in the pending claims is not obvious from the teachings of the prior art.

Applicant agrees with the Examiner's analysis of the prior art that Macken et al. teaches the use of insulation layers that have negative thermal expansion characteristics. However, Applicant's invention, as set forth in the specification and in amended independent claims 1, 6, 9 and 15 includes materials having negative thermal expansion characteristics that are not taught

by the cited prior art. These materials are carbon fiber, carbon fiber in an epoxy matrix, carbon fiber in a photoresist matrix, zirconium tungsten in an epoxy matrix, zirconium tungsten in a photoresist matrix, hafnium tungsten in an epoxy matrix, and hafnium tungsten in a photoresist matrix.

With regard to the newly applied teachings of Huang '427, Applicant notes that this patent teaches the formation of carbon composites by molding, using pressure and heat. A review of its specification reveals that the carbon composite material is typically fabricated utilizing pressures of at least 35kg/cm², and with temperatures of at least 500° C in a carbonization step and approximately 1,500° C or higher (up to 3,200° C) in a graphitization step. These pressures and temperatures are totally incompatible with the delicate magnetic head structures to which the present invention is directed. Thus the teachings of Huang '427 simply amount to a teaching that carbon composites exist and can be fabricated in the manner described therein. There is no suggestion in either Huang '427 or Macken '944 that these teachings may be combined as is done in the rejection. Furthermore, Huang '427 does not mention the claimed materials of carbon fiber in an epoxy matrix and carbon fiber in a photoresist matrix. Additionally, Huang '427 makes no mention whatsoever that "carbon fiber, carbon fiber in an epoxy matrix or carbon fiber in a photoresist matrix" are negative thermal expansion materials.

Applicant therefore respectfully submits that the teachings of Huang '427, when combined with the teachings of Macken do not render obvious Applicant's claimed invention of carbon fiber, carbon fiber in an epoxy matrix, carbon fiber in a photoresist matrix as negative thermal expansion materials suitable for use in a magnetic head. The other materials recited in the claims, zirconium tungsten in an epoxy matrix, zirconium tungsten in a photoresist matrix, hafnium tungsten in an epoxy matrix, and hafnium tungsten in a photoresist matrix are not mentioned in Huang '427 and are therefore allowable subject matter. Applicant respectfully submits that all of the materials included within the claims are not taught by the cited prior art, and that this ground of rejection of independent claims 1, 6, 9 and 15 has thereby been satisfied by this amendment.

With regard to dependent claims 3 and 11, Applicant submits that these claims are allowable in that they depend from an allowable base claim.

In paragraph 3 of the Office Action claim 5, 3, 13-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macken et al and Huang et al and further in view of Kudo et al (US. 2003/0193756 A1), stating:

"Macken et al as modified by Huang et al do not disclose a heat transfer layer as recited by claims 5, 8, 13-14 and 17.

Kudo et al discloses a slider having a magnetic head including a heat transfer layer 4.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the magnetic head of Macken et al as modified by Huang et al with a heat transfer layer as set forth, supra as taught by Kudo et al.

The rationale is as follows: One of ordinary skill in the art would have been motivated to provide the magnetic head of Macken et al as modified by Huang et al with a heat transfer layer as set forth, supra as taught by Kudo et al to dissipate the heat generated in the magnetic head/slider and a temperature rise can be inhibited, thus improve the read/write output characteristics of the head."

Responsive hereto, Applicant notes that the rejected claims are all dependent claims. Applicant asserts that these claims are now allowable in that they depend, either directly or indirectly, from an allowable amended independent base claim.

In paragraph 4 of the Office Action claims 4, 7, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macken et al as modified by Huang et al and further in view of Santini (US. 6,560,853 B1), stating:

"Macken et al. as modified by Huang et al disclose only a single layer of coils. Macken et al as modified by Huang et al, however, does not disclose two layers of inductive coils as recited in claims 4, 7, 12 and 16.

Santini discloses a magnetic head having a write head portion including two layers of inductive coils (212, 214) and at least an insulation layer (11-14) disposed between the induction coil layers.

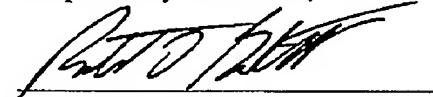
It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify one layer coils of the write head of Macken et al as modified by Huang et al with two layers of coils as set forth, supra as taught by Santini.

The rationale is as follows: One of ordinary skill in the art would have been motivated to modify one layer coils of the write head of Macken et al as modified by Huang et al with two layers of coils as set forth, supra as taught by Santini because two smaller diameter coils can produce the same flux density as a single coil, with less reluctance; wherein, less reluctance permits a faster rise time of the signal which results in a faster data rate, thus provide a better write characteristics of the write head."

Responsive hereto, Applicant notes that the rejected claims are all dependent claims. Applicant asserts that these claims are now allowable in that they depend, either directly or indirectly, from an allowable amended independent base claim.

Having responded to all of the paragraphs of the Office Action, and having amended the claims accordingly, Applicant respectfully submits that the Application is now in condition for allowance. Applicant therefore respectfully requests that a Notice of Allowance be forthcoming at the Examiner's earliest opportunity. Should the Examiner have any questions or comments with regard to this amendment, a telephonic conference at the number set forth below is respectfully requested.

Respectfully submitted,



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Reg. No. 28,852

Dated: February 28, 2006

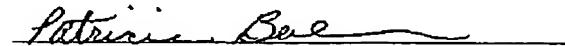
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February 28, 2006
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(Signature of Patricia Beilmann)

S/N: 10/631,940

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